I. C. 6561

MARCH, 1932

DEPARTMENT OF COMMERCE

UNITED STATES BUREAU OF MINES
SCOTT TURNER, DIRECTOR

APR 27
O. S. U.

INFORMATION CIRCULAR

QUARTZ GEM STONES

BY

I. AITKENS

INFORMATION CIRCULAR

DEPARTMENT OF COMMERCE - BUREAU OF MINES

QUARTZ GEM STONES [1]

(Amethyst, Carnelian, Rock Crystal, Rose Quartz, Smoky Quartz, etc.)

By I. Aitkens [2]

CONTENTS

	Page
Introduction	1
Description and properties	1
Uses	2
Identification	3
Substitutes	3
History	3
Mode of occurrence	4
Mining	4
Domestic production	4
Deposits in the United States	5
Foreign localities	7
Selected references	9
Appendix: Names of species and gem varieties	10

INTRODUCTION

Quartz maintains a rather conspicuous position among gem stones, despite its being the commonest and, in its natural form, the most easily recognized of mineral substances. This prominence is due primarily to the extensive use of amethyst, which provides stones of the finest violet color, and also to the wide employment of yellow quartz (citrine) which is called topaz by jewellers and vies with the true topaz in color and brilliance. Unlike many less costly gem materials quartz is hard and durable.

DESCRIPTION AND PROPERTIES

Quartz crystallizes in the rhombohedral system, generally as 6-sided prisms terminated at each end by 6-sided pyramids. Owing to differences in color and texture, some of which are of minor importance, quartz has been given a great variety of names. A considerable number of these names accompanied in each case by a brief description will be found in the appendix. The gem varieties of quartz, however, are all included in the following groups:

---

[1] The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular 6561."

[2] Rare metals and nonmetals division, U. S. Bureau of Mines.

Phanerocrystalline

- Amethyst
- Aventurine (quartz)
- Cat's eye
- Citrine
- Gold Quartz
- Milky quartz
- Rock crystal
- Rose quartz
- Rutilated quartz
- Siderite
- Smoky quartz
- Tiger's eye

Cryptocrystalline

- Agate
- Agatized wood
- Bloodstone
- Carnelian
- Chalcedony
- Chrysoprase
- Egyptian jasper
- Eye agate
- Fortification agate
- Jasper
- Moss agate
- Onyx
- Plasma
- Prase
- Riband jasper
- Sardonyx

The composition of quartz is essentially silica or silicon dioxide, SiO_2. When pure it is colorless, but the mineral is to be found in practically every color, due to impurities. These colors, however, are unstable and may be destroyed by a low heat. They are also susceptible to change by the action of X-rays, ultra-violet light, and radium. The luster is vitreous and the mineral may be transparent, translucent, or opaque.

Quartz is uniaxial and optically positive. Its mean index of refraction is only 1.55; its double refraction 0.009; and its dispersion 0.013; all are rather low, as gem materials go. The fracture is pronounced conchoidal. Quartz has a hardness of 7 and is very durable. While the specific gravity of pure quartz is 2.65 to 2.66, the range for its many varieties is from 2.5 to 2.8.

USES

Many varieties of quartz are used in the cheaper grades of jewelry, but with the notable exception of the better grades of amethyst, which are very beautiful, most quartz material is worth little more than the cost of cutting. In the form of clear rock crystal it is used, however, for innumerable ornamental objects such as cups, vases, art figures, crystal balls, etc., and is often cut into beads and fancy shapes. Fashioned to resemble the diamond, it is sold as "rhinestone," "Herkimer diamond," "Lake George diamond," or "Cornish diamond." Rock crystal also furnishes the material for certain special glasses and fused silica ware; and selected crystals are employed in optical instruments, for scientific and military use, chiefly as wedges for microscopic work and as spectographic prisms, and for piezo-electric plates which serve to control wave lengths in radio broadcasting.

The best grade of rose quartz is used in the manufacture of jewelry, chiefly for pins, necklaces, and settings for rings; however, it is also used extensively for vases, trays, paper weights, and like ornaments, and the cheaper grades are used for monumental works, such as facings for fireplaces and water fountains, and in pebble-dash finish in stucco work.

IDENTIFICATION

Quartz may be distinguished by its glassy luster, conchoidal fracture, hardness, and crystal form. Its hardness is such that it will scratch glass. Its lack of cleavage, general glass-like appearance, and pronounced conchoidal fracture, afford an easy determination. It is readily distinguished from topaz because it is softer and lighter, it will float in methylene iodide while topaz sinks rapidly.

SUBSTITUTES

Small quartz crystals have been produced artificially but never in sizes or colors to rival the natural mineral. Moreover, since most varieties are worth little more than the cost of cutting, there is no commercial advantage in manufacturing artificial material. Instead of having substitutes, quartz itself is used widely in imitation of the more expensive gems. Citrine, or yellow quartz, and smoky quartz, for example, are sold under trade names such as Scotch topaz, false topaz, and smoky topaz.

HISTORY

Quartz in its various forms has attracted attention from the earliest times. The water-clear crystallized variety was known to the Greeks as krystallos meaning clear ice; hence the name "crystal" or "rock crystal" as now applied to this particular variety. The name quartz3/ is an old German mining term of unknown meaning which has been in general use in all languages since the sixteenth century.

Amethyst is a name derived from the Greek word meaning not drunken--possibly due to a notion that it would protect the wearer from the results of unrestrained libations.

Chalcedony derives its name from the Greek name of a town in Asia Minor.

Prase, due to its dull leek-green hue, takes its name from the Greek word meaning a leek.

Plasma, which may have the same derivation, is a brighter leek-green.

3/ Smith, G. F. Herbert. Gem Stones: London, 1912, p. 240.

MODE OF OCCURRENCE

Quartz is widely distributed and occurs in rocks of all ages and of nearly every type, whether igneous, sedimentary, or metamorphic. Next to the feldspars, it is the most abundant mineral in the crust of the earth, forming about 12 per cent of the entire lithosphere.[4]

MINING

Quartz is generally mined from open pits. After being blasted from the ledge the material is broken up with sledges into lumps 6 or 8 inches in size and the quartz material is then sorted from the other mineral substances.

In Montana and those States through which the Yellowstone and Missouri Rivers flow, agates are found along the river beds and sometimes on gravel bars quite a distance from the sources of these rivers. Ranchers, sheep herders, and others living in these districts gather them, some making agate gathering a regular business. The surface stones have been practically all picked up and present supplies are limited mainly to stones exposed by the erosion produced by winter ice and spring rains.

DOMESTIC PRODUCTION

The production in the United States of most varieties of quartz of gem quality has always been rather small. Only a few domestic varieties are worth more than the cost of cutting, and then only when found as exceptionally fine stones. The following table gives the value of gem quartz produced in the United States from 1906 to 1921, when the United States Geological Survey discontinued the canvass of producers:

Table 1. - Value of quartz gems produced in the United States, from 1906-1921 [1]

Year	Value	Year	Value	Year	Value	Year	Value
1906	$7,050	1910	$3,872	1914	$18,838	1918	$15,211
1907	8,955	1911	3,884	1915	35,724	1919	17,632
1908	4,163	1912	3,313	1916	25,707	1920	14,676
1909	5,659	1913	16,861	1917	28,273	1921	11,114

[1] Compiled from Mineral Resources of the United States, Part 2 (annual chapters).

Although production in the United States is of small consequence, in certain cities the shops display cut gems and polished slabs of unusually high value. Billings, Livingstone, Miles City, and Glendive are the cutting centers in the State of Montana. Unusual specimens are prepared which bring as much as $250. Large quantities of this material are polished and mounted for eastern trade at Portland, Ore., and Seattle, Wash. The finish given these domestic stones has proved that the craftmanship of American workmen is equal to that of the foreign expert.

---

[4] Clark, F. W., Bull. U. S. Geol. Surv., 228, 1904, pp. 19, 20.

Digitized by Google Original from THE OHIO STATE UNIVERSITY

DEPOSITS IN THE UNITED STATES

In the past many fine agates were found on the lake shores of the Upper Peninsula of Michigan, where they weathered out of the trap rock. Amethyst also has been produced in various localities of the United States. In general, however, the domestic output has been small and sporadic, individual deposits usually being soon exhausted or proving unprofitable to work on a commercial scale.

Agates [5]

In many localities in the United States agates of considerable beauty if not of great size are found. Those found in Michigan on the shores of Agate Bay, Lake Superior, have rich coloring and make attractive charms and ornaments. Agates are found in the stream beds of many rivers in Colorado, Montana, and other regions of the Rocky Mountains. They are found also along the Mississippi River, especially in Minnesota, and along the Fox River in Illinois, in the trap rocks bordering the Connecticut River, and on the coasts of California and Oregon. The variety found in California is cut and sold under the name "California moonstone," a term as misleading as most trade names.

Moss or Landscape Agate

According to Foshag,[6] when nature desires to produce a unique type of agate, she permeates the silica with manganese or iron compounds, giving rise to moss or treelike forms, or islands in a minature ocean. This is designated as moss or landscape agate. Montana and Wyoming are the chief American sources; Montana supplies much of the moss agate cut for jewelry from pebbles and cobbles found along the Yellowstone River and its tributaries and on the mesas and buttes for many miles away from the river. No one knows just when or how these agates originally developed, but here they occur in rounded cobbles covered sometimes with a chalk-like but hard coating of silica.

In Laramie County, Wyoming, moss agate occurs in an irregularly shaped vein varying from less than an inch to nearly 2 feet in thickness and cutting nearly vertically across limestones of carboniferous age. The Wyoming agate is a clouded and more opaque form than the Montana agate.

Amethyst

Amethystine quartz has a wide distribution in the eastern United States, but nowhere does it occur in sufficient quantity to afford a stable industry. The crystals are sometimes of a beautiful color but are almost invariably scarred and broken.

---

[5] Farrington, O. C., Agate--Physical Properties and Origin: Field Mus. of Nat. Hist., Geol. Leaflet 8, Chicago, 1927, p. 5.

[6] Foshag, W. F., Gems and Gem Minerals: Smithsonian Sci. Ser., vol. 3; pt. 2, 1929, p. 229.

About 1921, amethysts were found and mined in Arizona to a notable extent on claims near the Roosevelt Dam. This was the first amethyst deposit of commercial importance discovered in the State. Although these crystals were taken from only 20 inches below the surface, they were of such fine quality that orders to the amount of $2,000 were obtained almost immediately from dealers and lapidaries in Los Angeles.

Amethyst Harbor on the shores of Lake Superior has yielded very large crystals, though not of good gem quality. Other localities that have produced good stones are Providence Township, Delaware County, and Chester County, Pa.; Haywood County, N. C.; and Rabun County, Ga.

Chrysoprase

According to Kunz,[7] two claims of chrysoprase were located about 6 miles southeast of Ione, Calif. At this location the chrysoprase occurs in serpentine as a seam 1-1/5 inch wide.

Crystal Quartz

In the eastern United States and in the Rocky Mountain regions, well-crystallized colorless quartz occurs in association with pegmatite veins. Beautifully clear examples of this crystal quartz have come from the Hot Springs region of Arkansas, where the mineral occurs as a secondary product in clefts and crevices in sandstones. This region forms one of the world's most noted deposits of crystal groups, where quartz occurs in small, very perfect, and highly lustrous crystals.

In the cavities of the limestones of Herkimer County, N. Y., are occurrences of small, very perfect, and highly lustrous crystals. A peculiarly interesting characteristic of this particular deposit is that the crystals are rarely over a centimeter in diameter; as a consequence, the natural crystals are sometimes perforated and strung as beads without further preparation, and prove very effective as well as unique; so great is their brilliance that they are commonly called "Herkimer diamonds."

Onyx [8]

An important deposit of onyx was discovered in Madison County, Mont., during the autumn of 1929, which is said to rival the Egyptian stone in both color and design. The Montana Onyx Co. of Butte first opened this quarry and is taking out the stone in small quantities for cutting and polishing. This onyx lies upon the surface in well-marked ledges, in a vein that has been traced over a quarter of a mile, and comes in a multitude of colors which form the most beautiful tapestry designs. Approximately one hundred different colors have been observed by the owners of this quarry.

---

[7] Kunz, Geo. F., Gems and Precious Stones: Min. Ind., 1927, p. 509.

[8] Pit and Quarry. Huge Deposit of Onyx found in Montana. Vol. 20, No. 12, Sept. 10, 1930, pp. 19-20.

Rose Quartz

What is declared to be one of the largest deposits of high-grade rose quartz in the country, if not the world, is located about 8 miles from Custer, S. Dak.[9] Throughout this district the quartz is of a beautiful rose color and is found in large segregations and also in small scattered masses. This district produces all gradations in color from white to pale pink or deep rose. At the Scott rose quartz mine near Custer the quartz occurs in large irregular masses in pegmatite, and it is believed that it represents a late crystallization during the consolidation of the magmatic solution at temperatures somewhat below the temperatures at which white quartz crystallized.

FOREIGN LOCALITIES

Brazil is noted for very important deposits of clear crystal quartz as well as of quartz of other varieties. Much of the quartz used for spectacle lenses and other technical purposes comes from Brazil, especially from the States of Minas Geraes, Sao Paulo, and Goyaz.

In the Swiss Alps both clear and smoky crystals occur in open cavities. From one such druse 20,000 pounds of good crystals were obtained. Lately Madagascar has produced much good rock crystal, which is utilized mostly in the manufacture of beads.

Agates [10]

At present the most extensive occurrence of agate known is in the mountain chain extending from Porto Alegre, State of Rio Grande do Sul, in Brazil, to the district of Salto in northern Uruguay. These agates form the principal source of supply for commercial purposes and are said to surpass all others in size and beauty.

Associated with the agates in the agate-bearing area in Uruguay are many hollow stones which are often lined with amethyst crystals. The agates are dug from shallow pits in grazing lands, where they occur in considerable quantity. They are also found in the stream beds of the region, where they have been deposited by floods. At present the largest diggings are about 100 miles north of Salto.

Amethyst

A discovery of amethyst was made in the vicinity of Pretoria, in South Africa, about 1927, where material of unusually deep color was found in large quantities. Although some 6,000 pounds of bulk material has been shipped, only specimens of jewel grade have been sent out. In 1928, a syndicate was formed with the object of exploiting this new discovery. During that year a 215-pound amethyst was found near Bahia, Brazil, and was sent to Oberstein, Germany, to be worked up. This was not of jewel grade, however, and would have been more valuable as a specimen.

---

[9] Rocks and Minerals, Rose Quartz: Vol. 4, June, 1929, p. 43.
[10] Farrington, O. C., Work cited, pp. 4-6.

Rock Crystal

In certain localities of Brazil, rock crystal is found in deposits that are usually small and scattered, but the crystals are water clear and range in size from 4 to 10 pounds. During the World War tons were produced to supply the demand for lenses, etc. More recently the demand for optical material has been greater than ever, and it is a question whether this material has ever before been so extensively used in physical experiments.

Recently two great masses of rock crystal, one weighing 528 pounds and the other 375 pounds, have been discovered in Brazil. Although the demand and price have dropped considerably in late years, rock crystal for spectacles and other optical work has increased on the average and the State of Bahia now supplies an abundance of it for these purposes.

In 1926, 14,016 pounds of rock crystal valued at $6,704 was exported from Bahia; in 1927, exports increased to 28,958 pounds valued at $10,072, a gain of 100 per cent in volume and of 50 per cent in value. However, exports dropped in 1928 to 19,408 pounds valued at $8,581.

SELECTED REFERENCES

Atkinson, A. S. Mining for gems in Brazil. Eng. and Min. Jour., June 19, 1909, p. 1234.

Bastin, Edson S. Contributions to economic geology, 1906: U. S. Geol. Survey Bull. 315, pt. 1, 1907, pp. 394-399.

Bauer, Max. Precious stones (Translated with additions by L. J. Spencer). Griffin and Co., Ltd., London, 1904, 627 pp.

Cattelle, W. R. Precious stones. Philadelphia and London, 1903, pp. 131, 152-156.

Dreher, O. Das Färben des Achates. E. Kessler, Idar, 1913, 20 pp.

Farrington, O. C. Agate: Physical properties and origin. Field Mus. of Nat. Hist., Geol. Leaflet 8, Chicago, 1927, pp. 1-19.

Forrest, John W. Crystal quartz in the optical industry. Foote-Prints, vol. 2, No. 2, 1929, pp. 28-41.

Foshag, W. F. Gems and gem minerals. Smithsonian Sci. Ser., vol. 3, pt. 2, 1929, pp. 224-231.

Freyberg, B. V. Geologic notes on the agate district of Serra Geral, Rio Grande do Sul, Brazil, Argentina, Acad. Nac. de Cien. Bol., vol. 30, Cordoba, 1927, pp. 129-170.

Harstad, A. J. The agate. Rocks and Minerals, vol. 2, March, 1927, pp. 3-5.

Hart, Gilbert, Jasper. Rocks and Minerals, vol. 5, June, 1930, pp. 60-61.

Kraus, E. H., and Holden, E. F. Gems and gem materials. London, 1925, pp. 144-152, 206-208.

Kunz, G. F. Gems and precious stones of North America. New York, 1890, pp. 112-115.

__________ The magic of jewels and charms. J. B. Lippincott Co., Philadelphia, 1915, 422 pp.

La Rue, E. A. The existence of agate and iceland spar in the Kerguelen Archipelago. Compt. rend., Paris, vol. 188, 1929, pp. 1421-1422.

Laufer, Berthold. Agate- archaeology and folk-lore. Field Mus. of Nat. Hist., Geol. Leaflet 8, Chicago, 1927, pp. 20-35.

Liesegang, Raphael Ed. Die Achate. Theodor Steinkopf, Dresden and Leipzig, 1915, 118 pp.

Manchester, James G. Asteriated rose quartz in New York. Min. World, June 11, 1910, pp. 1185-1186.

Merrill, G. P. Handbook of gems and precious stones. U. S. Nat. Mus. Bull. 118, 1922, pp. 20-28, 82-93.

Pit and Quarry. Huge deposit of onyx is found in Montana. Vol. 20, No. 12, Sept. 10, 1930, pp. 19-20.

Rocks and Minerals. Rose quartz. Vol. 4, June, 1929, p. 43.

Smith, G. F. Herbert. Gem stones. London, 1912, pp. 238-248.

Walls, R. R. Rock crystal and diamond pipes in Brazil. Geol. Mag., vol. 66, No. 777, London, 1929, pp. 111-116.

Walther, P. Quartz and chalcedony. Rocks and Minerals, vol. 4, No. 2, June, 1929, pp. 61-63.

APPENDIX: NAMES OF SPECIES AND GEM VARIETIES

Names of Mineral Species and Gems of the Quartz Group

Name	Description
Agate	Variegated chalcedony.
Agate jasper	Intermediate between jasper and chalcedony with predominant translucent chalcedony; jasper with bands of chalcedony.
Alaska diamond	Quartz.
Alençon diamond	Quartz crystal from Alençon, France.
Aleppo stone	Eye agate.
Amberine	Yellowish-green agate from the Death Valley region, Calif.
Amethyst	Purple and bluish violet quartz, in crystals.
Amethystine quartz	Quartz of an amethyst color, not necessarily in crystals.
Anacona ruby	Quartz.
Apricotine	Yellowish red quartz pebbles from vicinity of Cape May, N. J.
Arkansas diamond	Quartz crystals from Arkansas; also diamond from Arkansas.
Arrow points	Indian arrowheads mostly made of quartz, more rarely of obsidian or other fine-grained rock.
Aventurine	Opaque yellow, brown, or red massive quartz containing inclusions of minute scales of some other mineral, such as mica or iron oxide.
Azure quartz	Blue quartz.
Baffa diamond	Quartz crystal.
Basanite	Velvet black, flinty quartz.
Beckite	Silicified coral shells or fossiliferous limestone replaced by silica.
Beekite	Beckite.
Bishop's stone	Amethyst.
Bloodstone	Massive dark green jasper (plasma) with red or blood-colored spots; also hematite (German usage).
Blood jasper	Bloodstone.
Blue chrysoprase	Chalcedony stained blue with chrysocolla.
Blue moonstone	Blue chalcedony from the Death Valley region, Calif.
Bohemian diamond	Rock crystal (quartz).
Bohemian ruby	Red or rose quartz.
Bohemian topaz	Yellow quartz.
Brazilian diamond	Clear quartz from Brazil; also diamond from Brazil.
Brazilian pebble	Rock crystal (quartz).
Brazilian topaz	Smoky quartz artificially changed to yellow by heat; also golden to reddish yellow topaz.

Names of mineral species and gems of the quartz group (Cont.)

Name	Description
Briançon diamond	Quartz crystal from southeastern France, cut in Briançon.
Bristol diamond	Quartz crystal from Cornwall, England.
Burnt amethyst	Purple amethyst changed to brownish yellow by heat.
Cairngorm	Yellow to smoky brown, gray, or black quartz.
California moonstone	White or gray chalcedony.
Cape May diamond	Colorless and clear quartz crystal from Cape May, N. J.
Carnelian	Translucent red chalcedony.
Carnelian-onyx	Agate with red and white bands.
Catalinite	Beach pebbles from Santa Catalina Island, Calif.
Catalina-sardonyx	Catalinite.
Cat's-eye	Chatoyant quartz; or any mineral having a changeable luster or showing opalescence without play of colors.
Cer-agate	Chrome-yellow agate from Brazil.
Chalchihuitl	Applied to prase, green jasper, emerald, turquoise, and jadeite from Mexico.
Chalcedony	Compact silica, transparent or translucent, with a waxy luster.
Chalcedony-onyx	Agate with white and pale bands.
Chalcedonyx	Chalcedony with alternating stripes of gray and white.
Chert	Compact silica, includes flint, hornstone, and jasper.
Chinarump	Petrified wood from Arizona.
Citrine	Golden yellow quartz.
Cloudy chalcedony	Chalcedony with dark cloudy spots in a light gray transparent base.
Colorado topaz	Citrine (yellow quartz); also topaz from Colorado.
Cornish diamond	Quartz crystal from Cornwall, England.
Cotterite	Quartz having a metallic pearly luster.
Creolite	Banded jasper from Shasta County, Calif.
Crispite	Sagenite.
Crystal	Colorless transparent quartz; also artificial flint glass.
Cupid's darts	Quartz crystal with needle-like inclusions of goethite.
Dauphine diamond	Rock crystal (quartz).
Dendritic agate	Mocha stone and moss agate.
Egyptian jasper	Banded yellow, red, brown, or black jasper.
Egyptian pebble	Egyptian jasper.
Eldoradoite	Iridescent quartz from Eldorado County, Calif.

Names of Mineral Species and Gems of the Quartz Group (Cont.)

Name	Description
Emeraldine	Chalcedony artificially colored green.
Enhydros	Hollow nodules of chalcedony partly filled with water.
Eye agate	Concentric rings of agate with a dark center, also thomsonite.
False diamond	Quartz crystal.
False lapis	Agate or jasper artificially colored blue.
False topaz	Yellow quartz; also yellow fluorite.
Fancy agates	Agates showing delicate markings and intricate patterns.
Fleches d'amour	Sagenite (quartz).
Fleurus diamond	Quartz crystal.
Flint	Compact silica, opaque and of dull colors.
Flower stone	Beach pebbles (chalcedony) with flower patterns.
Fortification agate	Agate with parallel zigzag lines.
Fossil coral	Coral replaced by silica (beckite).
Frost stone	Translucent gray chalcedony with pure white patches or tufts like snowflakes, scattered through it, from the Mohave Desert, Calif.
Gold quartz	Massive quartz inclosing gold.
Golden topaz	Golden yellow citrine (quartz); or topaz of a golden yellow color.
Hair stone	Quartz with inclusions of hair-like crystals or fibers of some other mineral. Same as sagenite.
Heliotrope	Bloodstone (quartz).
Herkimer diamond	Clear quartz crystal from Herkimer County, New York.
Horatio diamond	Colorless quartz from Arkansas.
Hornstone	Compact form of silica, like flint but more brittle.
Hungarian cat's-eye	Quartz cat's-eye.
Hyacinth	Red zircon; also wrongly applied to essonite or other light-colored garnets, to yellowish red spinel from Brazil, and to red iron-stained quartz.
Hyacinth of Compostella	Quartz, with red hematite inclusions.
Imperial yu-stone	Green aventurine quartz.
Indian agate	Moss agate.
Indian topaz	Saffron-yellow topaz; also yellow quartz.
Iolanthite	Jasper from Crooked River, Crook County, Oregon.
Iridescent quartz	Rock crystal (quartz) filled with fine cracks containing air films which reflect the colors of the rainbow.

Names of Mineral Species and Gems of the Quartz Group (Cont.)

Name	Description
Iris	Iridescent quartz; also applied to other iridescent minerals. California iris is spodumene.
Irish diamond	Quartz crystal from Ireland.
Isle of Wight diamond	Quartz crystal.
Jasp agate	Intermediate between jasper and chalcedony with predominant opaque jasper.
Jasper	Massive quartz, impure and opaque, containing more iron oxide than agate.
Jasperine	Banded and variously colored jasper.
Kinradite	Jasper with spherulites of quartz, from the region around San Francisco, Calif.
Lake George diamond	Clear quartz crystal from Herkimer, N. Y.
Lavendine	Amethyst (quartz).
Love arrows	Sagenite (quartz).
Lydian stone	Basanite (quartz).
Maderia topaz	Citrine (quartz).
Marmorosch diamond	Quartz crystal from Marmaros Comitat, Hungary.
Milky quartz	Milky white in color and nearly opaque. Sometimes with greasy luster. (Dana).
Mocha stone	Chalcedony with brown, red, or black, tree-like inclusions of manganese oxide.
Mohave moonstone	Translucent, lilac-tinted chalcedony from the Mohave Desert, Calif.
Montana agate	Moss agate from Montana.
Mont Blanc ruby	Quartz.
Moonstone	Commonly but erroneously applied to some white or gray chalcedony and to satin spar (gypsum).
Mora diamond	Probably quartz crystal.
Morion	Deep black almost opaque smoky quartz.
Moss agate	Chalcedony with greenish moss-like or tree-like inclusions.
Mother-of-emerald	Prase (quartz).
Myrickite	Agate or chalcedony containing bright red inclusions of cinnabar, from the Death Valley region, Calif.
Needle stone	Sagenite (quartz).
Nicola	Onyx with a black or brown base and a bluish white, thicker, wavy top layer.
Novaculite	Fine-grained hard sandstone; flint (quartz).
Occidental agate	Agate less perfect than oriental agate.
Occidental amethyst	True amethyst (quartz).
Occidental cat's-eye	Quartz cat's-eye.
Occidental chalcedony	Somewhat opaque chalcedony; more opaque than oriental chalcedony.
Occidental diamond	Rock crystal (quartz).
Occidental topaz	Yellow quartz.
Onegite	Quartz with inclusions of hair-like crystals of geothite.

Names of Mineral Species and Gems of the Quartz Group (Cont.)

Name	Description
Onyx	Banded chalcedony with alternating bands of cloudy milk-white and another color, usually black.
Orange topaz	Smoky quartz changed to yellow by heat; or Spanish topaz.
Oriental agate	Finely marked and very translucent agate.
Oriental chalcedony	Very translucent chalcedony. (compare with occidental chalcedony).
Oriental jasper	Bloodstone (quartz).
Ouachita stone	Novaculite (whetstone); quartz.
Paphos diamond	Quartz.
Pebble	Rock crystal (quartz).
Pecos diamond	Quartz from Pecos River, Texas.
Petrified wood	Wood replaced by silica.
Plasma	Massive translucent quartz, dark grass-green in color, sometimes with white or yellow inclusions of celadonite or of delessite.
Prase	Massive, translucent, and spotted quartz of a green to leek-green color caused by inclusions of minute crystals of actinolite or other minerals.
Prismatic moonstone	Cloudy chalcedony (quartz) from Mohave Desert, Calif.
Pseudodiamond	Quartz crystal.
Quebec diamond	Quartz crystal.
Rainbow agate	Agate which shows iridescence when cut across the concentric structure.
Rainbow quartz	Iridescent quartz.
Rhinestone	Rock crystal (quartz).
Riband agate	Agate with parallel layers.
Riband jasper	Jasper with differently colored, alternating bands.
Ribbon agate	Banded agate.
Ring agate	Agate with differently colored bands arranged in concentric circles.
River agate	Moss agate pebbles found in brooks and streams.
Rock crystal	Clear quartz crystal.
Rose quartz	Massive rose-red to pink quartz.
Rubasse	Quartz artificially stained red.
Sagenite	Transparent quartz with inclusions of hair-like or needle-like crystals or fibers of some other mineral, generally rutile.
Sandy sard	Sard dotted with darker spots (quartz).
Sapphire quartz	Blue quartz.
Sapphirine	Blue chalcedony, blue quartz; also blue spinel.
Sard	Chalcedony of a rich brown color, with a reddish tint; brownish red or dark brown carnelian (sardoine).
Sardoine	Brownish red or dark brown carnelian.
Sardonyx	(Sard-onyx) white and brown banded chalcedony.

Names of Mineral Species and Gems of the Quartz Group (Cont.)

Name	Description
Saxon topaz	Pale wine-yellow topaz; also citrine (quartz).
Schaumberg diamond	Quartz crystal from Schaumberg, Hesse, Germany.
Schiller quartz	Quartz cat's-eye.
Scotch topaz	Smoky quartz.
Semicarnelian	Yellow agate.
Siberian amethyst	Rich or dark colored amethyst.
Siderite	Sapphérine (blue quartz).
Silicified wood	Wood replaced by silica and small amounts of iron compounds.
Sinople	Quartz having red hematite inclusions.
Smoky quartz	Quartz crystals of a smoky or brown color.
Smoky topaz	True topaz of a smoky color; also more commonly smoky quartz.
St. Stephen stone	Translucent chalcedony with round blood-red spots through it.
Star stone	Starolite (quartz).
Starolite	Asteriated quartz.
Swiss lapis	Agate or jasper artificially colored blue.
Test stone	Basanite (jasper).
Texas agate	Agate jasper from Texas.
Thetis hairstone	Transparent quartz with inclusions of hair-like crystals of green actinolite.
Tiger-eye	Yellow to brown altered crocidolite.
Touchstone	Basanite (jasper).
Tree agate	Mocha stone.
Tree stone	Mocha agate.
Trenton diamond	Quartz crystal from Herkimer County, N. Y.
Unripe diamond	Quartz.
Vallum diamond	Quartz crystals from the Tanjore district, Madras Presidency, India.
Venus's hairstone	Sagenitic quartz (Fay).
Violite	Compact purple chalcedony from San Diego County, Calif.
Water agate	Shell of chalcedony containing bubbles of water.
Wax agate	Yellow agate, with a pronounced waxy luster.
White carnelian	Cloudy, milk-white, or very pale reddish or yellowish chalcedony.
White sapphire	Colorless quartz or corundum.
White topaz	Colorless quartz or topaz.
Wood agate	Wood petrified or replaced by agate.
Wood stone	Silicified wood.
Zonite	Variously colored chert or jasper, from Arizona.